

10.5 Safe Dams Act

10.5.1 Background

National responsibility for the promotion and coordination of dam safety lies with the Federal Emergency Management Agency (FEMA). State responsibility for administration of the dam safety criteria lies with Connecticut Department of Environmental Protection (DEP). Rules and regulations relating to applicable dams are promulgated by DEP in accordance with Connecticut General Statute 22a-401 through 410. The designer should ensure that the design conforms to the minimum design criteria in the “Connecticut Guidelines for Soil Erosion” prepared by DEP.

Under Connecticut statutes, DEP regulates all dams, dikes, or similar structures, which failure may endanger life or property.

10.5.2 Classification

Dams are classified as either new or existing, by hazard potential, and by size. Hazard potential categories are listed in the ConnDEP/Bureau of Water Management, Regulations Concerning Dam Safety Inspection.

10.5.3 New Dams

Information and regulations that should be consulted for further details and engineering requirements are given in the Environmental Permit Application Package instructions for completing a permit application for programs administered by the Inland Water Resources Division, ConnDEP.

10.5.4 Planning Considerations

Increased downstream erosion, sedimentation and flooding may be caused by **increased runoff volume**, increased peak discharge, reduced time of concentration, or reduced natural storage.

To minimize design costs and to obtain regulatory approval, detention basins should be designed to avoid inland wetlands and watercourses. It will also not require the detention basin to be subject to water diversion or dam safety regulation. A local or state inland wetlands permit will be required if a detention basin is proposed in a wetland area. In accordance with CGS-22a-403 inland wetland, diversion and SCEL permits are **NOT** required to alter, repair or remove an existing dam if a dam permit is required. However, the construction of a new dam which requires a dam safety permit is exempt from inland wetland permitting but not exempt from diversion or SCEL permitting requirements.

A state water diversion permit from the DEP’s Inland Water Resources Division will be required if the contributing drainage area to the detention basin is greater than 40.5 hectares (100 acres). If the contributing drainage is less than 40.5 hectares (100 acres) and no inland wetlands or watercourses are involved then a diversion permit will not be required. However, if wetlands and/or watercourses are involved, a diversion permit may be required and a permit need determination should be sought from the DEP. The location of detention basins in wetlands is discouraged.

The DEP also regulates all dam construction within the state. Contact DEP Inland Water Resources Division early in the planning process to determine the potential need for a dam construction permit. Try to keep the effective height of the dam less than 4.6 m (15 feet) and the product of the storage volume times the effective height of the dam less than 370 hectare meter

(3,000 acre feet) (see design criteria below). If these limitations are exceeded, the design criteria for the embankments of the detention basin are raised to a higher standard.

Carefully consider the visual design of the detention basins in areas of high public visibility and those associated with recreation. The underlying criterion for all visual design is appropriateness. The shape and form of basins, excavated material and plantings are to relate visually to their surroundings and to their function.

In planning the detention basin, consider safety features to protect the public. Design and locate any safety features so as not to interfere with the hydraulic operation of the structure.

For projects which include a temporary sediment basin, it is sometimes advantageous to locate the temporary sediment basin at the site of the detention basin. Sharing the same location may minimize site disturbance and cost. When this approach is used, the size requirements of both the detention and sediment basins must be determined and the larger of the two must be in place during the construction period. After construction, the minimum size shall be that of the detention basin. The construction should be phased so increases in runoff are controlled during the development of the project. One approach would be to construct the detention basin along with its berm and outlet works first, and expand the storage volume, if need be, to that required for the sediment basin.

The permanent outlet works may have to be temporarily modified during the construction period to provide the necessary wet and dry storage requirements for the temporary sediment basin and enhance the basin's ability to remove sediment. Upon stabilization of the contributing watershed, accumulated sediment is removed from the basin and any work, such as modifying the outlet works or installing permanent plantings, is done to complete the permanent detention basin.

On-site detention may be undesirable when the site is located in the lower portions of a watershed before the confluence with a perennial watercourse. If detention is located in the lower reaches of a watershed, there is a risk, depending on the size and release rate of the basin, that the peak flows from the outlet control structure could combine with the peak flows from the upper reaches, thus increasing peak flows or sustaining peak flows over longer periods. These increases could result in prolonged flooding and channel erosion along and within the perennial stream course downstream of the site.

To avoid this problem, a hydrologic analysis is required by an engineer. Locate the area downstream that is to be targeted for protection from additional runoff. A target area might be a flood prone road crossing, eroding stream bank or reach of stream where homes are currently endangered. Delineate the watershed to the targeted area. Determine where the proposed detention basin is located within that watershed. Conduct a hydrograph analysis to determine the timing of peak discharges. Use the Natural Resources Conservation Service (NRCS) Technical Releases 20 or 55, U.S. Army Corps of Engineers HEC-1 or other appropriate methods which produce hydrographs to evaluate existing and post-development conditions.

If the hydrograph analysis shows that detention is detrimental to the target area, but nearby downstream concerns are present, other methods to decrease peak flows from the site will need to be utilized.

Finally, the ownership and responsibility for operation and maintenance of the detention basin needs to be considered before the design process begins and should be determined by the completion of the local regulatory processes. The owner may be a homeowner, a homeowners association or a municipality.